



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,890	08/28/2003	Shinichi Suzuki	81707.0187	9583

26021 7590 04/14/2005

HOGAN & HARTSON L.L.P.
500 S. GRAND AVENUE
SUITE 1900
LOS ANGELES, CA 90071-2611

EXAMINER

MAYES, MELVIN C

ART UNIT	PAPER NUMBER
----------	--------------

1734

DATE MAILED: 04/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/652,890

Applicant(s)

SUZUKI ET AL.

Examiner

Melvin Curtis Mayes

Art Unit

1734

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-6, 8-13, 15-19 and 21-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12 and 25 is/are allowed.
- 6) ☒ Claim(s) 8-11, 13, 21-24 and 26-30 is/are rejected.
- 7) ☒ Claim(s) 2-6 and 15-19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1734

DETAILED ACTION

(1)

The indicated allowability of claims 8-11, 13, 21-24 and 26 is withdrawn.

Claim Rejections - 35 USC § 112

(2)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(3)

Claim 28 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 28 depends from Claim 27 which uses a composite sheet produced by the method including claims 5, 6, 8-11, 18, 19 and 21-24 which claim the different kind of sheet is a metal sheet or a ceramic sheet. Claim 28 does not further limit Claim 27.

Claim Rejections - 35 USC § 103

(4)

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

(5)

Claims 8, 9, 13, 21, 22, 26, 27, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farooq et al. 6,200,400.

Farooq et al. 6,200,400 discloses a method of making a capacitor comprising: providing a green ceramic sheet 80 of low dielectric constant (low k) ceramic and having hole filled with metal paste 84; providing a green sheet 86 of high dielectric constant (high k) ceramic and with an hole; positioning green sheet 80 over green sheet 86; using a punching device, creating and inserting a slug from green sheet 80 into the hole in green sheet 86; and performing standard MLC processing of stacking and laminating high k sheets and co-sintering to form a final ceramic structure in which metal conductor formed from metal paste is surrounded by the low dielectric constant ceramic. As shown in the Figures 3A, the final structure made comprises high dielectric constant (high k) layers 62, vias surrounded by low dielectric constant (low k) material 70 and pads 69 formed on the top of the vias and low k material and metal electrodes 67 and 68 on the high k layers 62 and low k material layers 70. As shown, the metal electrodes overlap the boundary between the low k and high k layers of each high k sheet. The metal paste is formulated to enable cofiring the metal and ceramic green sheet (col. 5-6).

By providing metal electrodes on each high k sheet to overlap the high k and low k layers, a conductive pattern is obviously formed on the surface of the first (high k) and second (low k) sheets before stacking the high k sheets and a paste is obviously applied onto the boundary portion between first (high k) and second (low k) sheet to form a coating layer, as the use of metal paste to fill via holes and form metal electrodes for cofiring is well known in the art of standard MLC processing.

(6)

Claims 10 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farooq et al. as applied to claims 8 and 21 above, and further in view of Ikeda et al. 5,656,113.

Farooq et al. disclose cofiring using metal paste of metal such as tungsten, molybdenum or other metals.

Ikeda et al. teach that a high dielectric ceramic for a capacitor and which is sintered with conductive layers of tungsten, molybdenum or other high-melting temperature metal comprises aluminum nitride which is sintered at 1600-2100°C (col. 1, line 65 – col. 3, line 31).

It would have been obvious to one of ordinary skill in the art to have modified the method of Farooq et al. for making a capacitor by providing the high k sheets of ceramic which allows cofiring the sheets and metal paste at 1600-2100°C, and thus in excess of 1100°C as claimed, as taught by Ikeda et al., for sintering high dielectric ceramic when sintering with conductive layers of tungsten, molybdenum or other high-melting temperature metal.

(7)

Claim 11 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farooq et al. as applied to claims 8 and 21 above, and further in view of Bischoff et al. 5,603,147.

Farooq et al. disclose cofiring using metal paste of metal such as tungsten, molybdenum or other metals.

Bischoff et al. teach that in making a capacitor of high dielectric constant material, reducing the sintering temperature reduces the amount of energy necessary and by making the sintering temperature less than 1000°C, the electrodes can be made of palladium-silver, a much

Art Unit: 1734

cheaper substance than platinum electrode material which would need sintering temperatures exceeding 1000°C (col. 4, line 60 – col. 5, line 2).

It would have been obvious to one of ordinary skill in the art to have modified the method of Farooq et al. for making a capacitor by providing the high k sheets of ceramic which allows cofiring the sheets and metal paste at less than 1000°C, and thus not higher than 1050°C as claimed, as taught by Bischoff et al., to reduce the energy necessary for cofiring and allow the use of palladium-silver as electrode material, a much cheaper substance than platinum electrode material which would need sintering temperatures exceeding 1000°C.

Allowable Subject Matter

(8)

Claims 12 and 25 are allowed.

(9)

Claims 2-6 and 15-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 1734

Conclusion

(10)

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Bross et al. disclose punching a sheet of metal into a ceramic having a circuit pattern.

(11)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Melvin Curtis Mayes
Primary Examiner
Art Unit 1734

MCM
April 13, 2005